U.U.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/263,125	06/21/94	KATAYANAGI K	SONYP4412

E3M1/1128

PHILIP M. SHAW, JR.
LIMBACH & LIMBACH
2001 FERRY BUILDING
SAN FRANCISCO, CA 94111-4262

EXAMINER	
CHOWDHURY, I	
ART UNIT	**PAPER NUMBER**
2308	3

DATE MAILED: 11/28/95

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☑ This application has been examined ☐ Responsive to communication filed on ________ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), Ø days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☑ Notice of References Cited by Examiner, PTO-892.
2. ☑ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☑ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ ________

Part II SUMMARY OF ACTION

1. ☑ Claims 1-22 are pending in the application.

   Of the above, claims ________ are withdrawn from consideration.

2. ☐ Claims ________ have been cancelled.
3. ☐ Claims ________ are allowed.
4. ☑ Claims 1-22 are rejected.
5. ☐ Claims ________ are objected to.
6. ☐ Claims ________ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on ________. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on ________. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed ________, has been ☐ approved; ☐ disapproved (see explanation).
12. ☑ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☑ been received ☐ not been received ☐ been filed in parent application, serial no. ________ ; filed on ________.
13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

PTOL-326 (Rev. 2/93)

Part III DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

2. Claims 1 and 21 objected to because of the following informalities:

a) In claim 1, line 6 "detecting noise domains" the examiner does not clearly see an explanation of what "noise domain" is in this claim or in the specification. A "domain" usually corresponds to a transformation into a set such as time domain to frequency domain. Please explain.

b) In claim 21, the claim depends on itself. Should this be dependent on claim 20 or some other claim?

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. Claims 1-22 rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per Claim 1, limitation b) states a "noise domain detection means" yet the connection between this component and the rest of the system is not clear. Where is the "receiving apparatus" described or present in this claim? Is the "noise domain detection means" part of the receiving apparatus? Please clarify.

As per Claims 2-16, these claims incorporate errors from Claim 1 which they are dependent on.

As per Claim 7, lines 3 the phrase "the noise detection domain" lacks clear antecedent basis in that noise detection domain is not defined in this claim or a previous claim.

As per Claim 8, line 2 the phrase "said noise level detection means" lacks clear antecedent basis in that noise level detection is not defined in this claim or a previous claim.

As per Claim 17, line 1 the phrase "transmitting receiving apparatus" is vague and indefinite. Should this be "transmitting and receiving"?

As per Claims 18-22, these claims incorporate errors from Claim 17 which they are dependent on.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 17-22 rejected under 35 U.S.C. § 102(b) as being anticipated by Borth et al. (4,628,529).

As per Claim 1, Borth teaches

a) a speech signal transmitting encoding circuit comprising a microphone and other circuitry for compressing speech signals by digital signal processing at a high efficiency (his col 2 lines 1-14 and lines 50-58 in which after removal of noise the system is encoded and transmitted for digital cellular telephone system. A microphone is taught in Col 2, lines 1-14.);

b) noise domain detection means for detecting noise domains using analytic patterns produced by said speech signal transmitting encoding circuit (his col 3, lines 11-37 in

which analytic parameters correspond to signal-to-noise ratio values and this parameter is used to determine if amount of noise in channel is above threshold);

c) means for controlling the received sound volume responsive to the noise level detected by said noise domain detection means (his col 3, lines 11-18 "The gain of these channels is then adjusted according to the modification signal ... post-processed output speech signal.").

As per Claim 18, Borth teaches detection of the speech level entering said transmitting microphone of the transmitter directly after turning on of a power source for talk transmission (this is inherently taught in col 2, lines 1-14 for a cellular speaker phone due to transient noise from the engine and other power sources).

As per Claims 19 and 20, Borth teaches noise domain detection means that detects the speech level entering said transmitting microphone when the speech level in said receiver exceeds a pre-set value and detection occurs at a pre-set time interval in the standby state of said transmitter for signal reception (his col 2, lines 1-31 "... used in relatively high background noise environments requiring noise suppression levels approaching 20 dB, there is a substantial degradation in voice quality ... which provides sufficient background noise

attenuation ..." A standby state for cellular telephones is well known in the telephone art.)

As per Claims 21 and 22, Borth teaches noise domain detection means to detect the speech level entering said transmitting when the speech level in said receiver exceeds a pre-set value (his col 12, lines 67-68 and col 13, lines 1-13).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

7. Claims 2-16 rejected under 35 U.S.C. § 103 as being unpatentable over Borth et al as applied to claim 1 above, and further in view of Gerson et al ("Vector Sum Excited Linear Prediction (VSELP) Speech Coding at 8KBPS").

As per Claim 2, Borth teaches noise domain detection means for detecting noise domains using analytic patterns produced by said speech signal transmitting encoding circuit and one frame deemed to be a noise domain if parameter is smaller than preset threshold (his Fig. 6b and col 12, 67-68 and col 13, lines 1-10 "current post-processed energy value exceeds a predetermined noise threshold ... decision that only noise is present is made" in which obvious modification to reverse inequality) but does not show use of first-order linear prediction encoding coefficients as analytic parameter for each frame. Gerson et al. shows use of first-order linear prediction encoding coefficients as analytic parameter for each frame (his Pg 1, left col, I. Introduction "Vector Sum Excited Linear Prediction falls into the class of speech coders known as Code Excited Linear Prediction" which is type of linear prediction encoding and Fig. 1, left col, 4th paragraph "second and third sources are from two VSELP excitation codebooks ... two VSELP excitation codebooks.") in an analogous art for the purpose of good coding performance at very low data rates. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use linear prediction encoding coefficients as the analytic parameter to determine whether a noise domain is present because this achieves high speech quality while maintaining reasonable complexity (Pg 1, left col, 4th paragraph).

As per Claims 3-4, 10 and 11, Gerson teaches noise domain detection means employs a pitch gain indicating the intensity of pitch components as the analytic parameter for each frame (his Pg 1, left col, "II. Basic Coder Structure" in which "The first is from the long term ("pitch") predictor state, or adaptive codebook." and also Pg 4, section VII. "Adaptive Pre and Postfiltering" teaches calculation of pitch gain. The comparison of pitch gain within a pre-set range or equal to zero is given in rejection to claim 2 above.)

As per Claims 5 and 12, Gerson teaches noise domain detection means employs a frame power as the analytic parameter for each frame (his Pg 3, sec. "V. Quantization of Excitation Gains" in which a gain codebook is generated containing coded speech energy "The first stage codes the average speech energy once per frame." and Pg 3, right col, 1st paragraph "... gain codebook which minimizes the total weighted error for the subframe is chosen." and inequality is inequality is taught in rejection to claim 2 above.)

As per claims 6, 7, 13, and 14, Gerson teaches if an amount of change of the frame power between a current frame and a past frame exceeds a pre-set threshold (his Pg 4, section "VI. Optimization of the Basis Vectors", 1st paragraph "Since the coder subframes are not independent, this procedure is iterated in a closed loop fashion." which implies that subtraction is

being done between current and past iteration of the frame energies. Determination of whether noise or speech domain is taught in Borth as given in rejection to claim 1 above.)

As per Claims 8 and 15, Gerson teaches noise level detection means performs filtering on a noise level output of the noise domain detected by said noise domain detection means (his Fig 1 in which pitch prefilter synthesis filter and spectral postfilter are present.)

As per Claims 9 and 16, Gerson teaches that the filtering performed by said noise level detection means on the noise level output is minimum value filtering (his Pg 4, left col, sec. "VII. Adaptive Pre and Postfiltering" in which eqn 25 contains a min function for pitch prefilter.)

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Rabiner and Schafer (Digital Processing of Speech Signals) teaches pitch detection using LPC parameters.

Pinckley (5,146,504) teaches automatic gain control circuit which uses frame power detector to determine power of each frame.

Yang et al. (5,432,859) teaches noise-suppression circuit application of separate gains to separate bands and then

recombines them in a signal combiner to generate output signal in which the noise has been suppressed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Indranil Chowdhury whose telephone number is (703) 305-3868.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Allen R. MacDonald, can be reached on (703) 305-9708. The facsimile phone number for this group is (703) 308-5356.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-9600.

ALLEN R. MACDONALD
SUPERVISORY PATENT EXAMINEP
ART UNIT 2308

Indranil Chowdhury
November 12, 1995